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Job No.: CTCE/BBMP/W.No.14/RN/BC/AIV/2016-17 03.03.2017

TEST REPORT ON IMPACT VALUE OF AGGREGATES

* Customer	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Nithin,** #66, Nisargadama, 3rd Main Road, 2nd Cross, Hemavathi Nagara, Hasan – 573201.
* Name of Work	:	Improvements to Roads & Drains at Muneshwara Nagara and Ashoka Nagara Ward No.14, Bagalagunte, BBMP, Bangalore.
* Reference	:	BBMP/DZ/AEE/TDSD/PR/600/1/2016-17 Dated: 10.01.2017
* Sample ID	:	Hot mix plant, Bangalore.
* Type of Mix	:	Bituminous Concrete
Technical Reference	:	IS: 2386 (Part- 4)-1963 (RA-2011)
Date of Testing	:	03.03.2017

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	388	390	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	306	307	
4	Aggregate Impact value = percent fines 100* (W2/W1) percent	21.13	21.28	**21.21**

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note:

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Job No.: CTCE/BBMP/W.No.14/RN/BC/Shape.T/2016-17 03.03.2017

TEST REPORT ON FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

* Customer	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Nithin,** #66, Nisargadama, 3rd Main Road, 2nd Cross, Hemavathi Nagara, Hasan – 573201.
* Name of Work	:	Improvements to Roads & Drains at Muneshwara Nagara and Ashoka Nagara Ward No.14, Bagalagunte, BBMP, Bangalore.
* Reference	:	BBMP/DZ/AEE/TDSD/PR/600/1/2016-17 Dated: 10.01.2017
* Sample ID	:	Hot mix plant, Bangalore
Technical Reference	:	IS : 2386(Part -1)-1963 (RA-2011)
* Type of Mix	:	Bituminous Concrete
Date of Testing	:	03.03.2017

Sl.No.	Description	Result
1	Flakiness Index	12.32%
2	Elongation Index	13.86%
3	Combined Flakiness & Elongation Index	26.18%

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.14/RN/BC/Stripping/2016-17 04.03.2017

TEST REPORT ON STRIPPING VALUEOF ROAD AGGREGATES (STATIC IMMERSION TEST)

* Customer	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Nithin,** #66, Nisargadama, 3rd Main Road, 2nd Cross, Hemavathi Nagara, Hasan – 573201.
* Name of Work	:	Improvements to Roads & Drains at Muneshwara Nagara and Ashoka Nagara Ward No.14, Bagalagunte, BBMP, Bangalore.
* Reference	:	BBMP/DZ/AEE/TDSD/PR/600/1/2016-17 Dated: 10.01.2017
Technical Reference	:	IS: 6241
* Type of Mix	:	Bituminous Concrete
Date of Testing	:	04.03.2017

Type of binder : 80/100
Percentage of binder used : 5.00% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.00 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.5	3.43	96.57
2	3.6		
3	3.2		

*Information is furnished by the Customer/Representative.

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.14/RN/BC/Sp_Wa/2016-17 04.03.2017

TEST REEPORT ON SPECIFIC GRAVITY AND WATER ABSORPTION

* Customer	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Nithin,** #66, Nisargadama, 3rd Main Road, 2nd Cross, Hemavathi Nagara, Hasan – 573201.
* Name of Work	:	Improvements to Roads & Drains at Muneshwara Nagara and Ashoka Nagara Ward No.14, Bagalagunte, BBMP, Bangalore.
* Reference	:	BBMP/DZ/AEE/TDSD/PR/600/1/2016-17 Dated: 10.01.2017
* Sample ID	:	Hot mix plant, Bangalore
Technical Reference	:	IS : 2386(Part -3)-1963 (RA-2011)
* Type of Mix	:	Bituminous Concrete
Date of Testing	:	04.03.2017

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2001	2002	2003	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1239	1238	1248	
4	Weight of saturated surface dry aggregate in air	W_3 g	2019	2021	2022	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	780	783	774	
6	Weight of oven dried aggregate	W_4 g	2003	2004	2006	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.568	2.559	2.592	2.573
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.622	2.616	2.646	2.628
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.80%	0.85%	0.80%	0.81%

*Information is furnished by the Customer/Representative.

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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Job No: CTCE/BBMP/W.No.14/RN/BC/Bitumen/2016-17 04.03.2017

TEST REPORT ON BITUMEN CONTENT OF BITUMINOUS CONCRETE MIX

* Customer	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Nithin,** #66, Nisargadama, 3rd Main Road, 2nd Cross, Hemavathi Nagara, Hasan – 573201.
* Name of Work	:	Improvements to Roads & Drains at Muneshwara Nagara and Ashoka Nagara Ward No.14, Bagalagunte, BBMP, Bangalore.
* Reference	:	BBMP/DZ/AEE/TDSD/PR/600/1/2016-17 Dated: 10.01.2017
* Sample ID	:	Roads at Muneshwara Nagara Ward No.14
Technical Reference	:	IRC:SP:11-1984
Date of Testing	:	04.03.2017

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474	473.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	26	26.50
7. Bitumen content in %	5.20	5.30
8. Average	5.25	

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Job No: CTCE/BBMP/W.No.14/RN/BC/Bitumen/2016-17 04.03.2017

TEST REPORT ON BITUMEN CONTENT AFTER GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

* Customer	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Nithin,** #66, Nisargadama, 3rd Main Road, 2nd Cross, Hemavathi Nagara, Hasan – 573201.
* Name of Work	:	Improvements to Roads & Drains at Muneshwara Nagara and Ashoka Nagara Ward No.14, Bagalagunte, BBMP, Bangalore.
* Reference	:	BBMP/DZ/AEE/TDSD/PR/600/1/2016-17 Dated: 10.01.2017
* Sample ID	:	Roads at Muneshwara Nagara Ward No.14
Technical Reference	:	IRC:SP:11-1984
Date of Testing	:	04.03.2017

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	42.32	8.93	8.93	91.07	79-100
9.5	35.26	7.44	16.37	83.63	70-88
4.75	72.15	15.22	31.59	68.41	53-71
2.36	69.35	14.63	46.22	53.78	42-58
1.18	53.26	11.24	57.46	42.54	34-48
0.6	52.15	11.00	68.46	31.54	26-38
0.3	44.65	9.42	77.88	22.12	18-28
0.15	35.26	7.44	85.32	14.68	12-20
0.075	39.65	8.36	93.68	6.32	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	35.85	7.57	7.57	92.43	79-100
9.5	42.28	8.93	16.50	83.50	70-88
4.75	66.32	14.01	30.51	69.49	53-71
2.36	73.26	15.47	45.98	54.02	42-58
1.18	63.35	13.38	59.36	40.64	34-48
0.6	55.56	11.73	71.09	28.91	26-38
0.3	36.32	7.67	78.76	21.24	18-28
0.15	27.15	5.73	84.50	15.50	12-20
0.075	38.15	8.06	92.55	7.45	4-10

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Job No.: CTCE/BBMP/W.No.14/RN/BC/Agg/2016-17 04.03.2017

TEST REPORT ON GRADATION OF AGGREGATE

* Customer	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Nithin,** #66, Nisargadama, 3rd Main Road, 2nd Cross, Hemavathi Nagara, Hasan – 573201.
* Name of Work	:	Improvements to Roads & Drains at Muneshwara Nagara and Ashoka Nagara Ward No.14, Bagalagunte, BBMP, Bangalore.
* Reference	:	BBMP/DZ/AEE/TDSD/PR/600/1/2016-17 Dated: 10.01.2017
* Sample ID	:	Bituminous Concrete
Technical Reference	:	IS : 2386(Part -1)-1963 (RA-2011)
* Type of Mix	:	Hot mix plant, Bangalore
Date of Testing	:	04.03.2017

Total Weight of Sample: **5200** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per `MORTH 500-18
13.2	735	14.13	14.13	85.87	79 - 100	
9.5	525	10.10	24.23	75.77	70 - 88	
4.75	615	11.83	36.06	63.94	53 - 71	
2.36	540	10.38	46.44	53.56	42 - 58	
1.18	525	10.10	56.54	43.46	34 - 48	
0.600	555	10.67	67.21	32.79	26 - 38	
0.300	580	11.15	78.37	21.63	18 - 28	
0.150	380	7.31	85.67	14.33	12 - 20	
0.075	365	7.02	92.69	7.31	4 - 10	

Total Weight of Sample: **5300** gm

Sieve Size, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH 500-18
13.2	640	12.08	12.08	87.92	79 - 100	
9.5	525	9.91	21.98	78.02	70 - 88	
4.75	635	11.98	33.96	66.04	53 - 71	
2.36	595	11.23	45.19	54.81	42 - 58	
1.18	625	11.79	56.98	43.02	34 - 48	
0.600	525	9.91	66.89	33.11	26 - 38	
0.300	555	10.47	77.36	22.64	18 - 28	
0.150	365	6.89	84.25	15.75	12 - 20	
0.075	425	8.02	92.26	7.74	4 - 10	

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Job No.: CTCE/BBMP/W.No.14/RN/BC/Stability/2016-17 04.03.2017

TEST REPORT ON MARSHALL STABILITY OF MIX

* Customer	:	**Asst. Executive Engineer**, T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	:	**Mr. R. Nithin,** #66, Nisargadama, 3rd Main Road, 2nd Cross, Hemavathi Nagara, Hasan – 573201.
*Name of the Work	:	Improvements to Roads & Drains at Muneshwara Nagara and Ashoka Nagara Ward No.14, Bagalagunte, BBMP, Bangalore.
*Reference	:	BBMP/DZ/AEE/TDSD/PR/600/1/2016-17 Dated: 10.01.2017
* Source	:	Hot mix Plant, Bangalore
* Type of Mix	:	Bituminous Concrete
Date of Testing	:	04.03.2017

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshall Stability, Kn	9.45	9.60	9 Kn (min)
2	Marshall flow, mm	2.60	3.15	2 – 4
3	Percent air voids in Mineral Aggregate	3.25	4.30	3 – 6
4	Voids in Compacted Mix	13.15	14.05	13 - 15
5	Percent Voids filled with Bitumen	67.20	68.30	65 - 75
6	Density, g/cc	2.27	2.28	--

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